ECONOMIC GEOLOGY

AND THE

BULLETIN OF THE SOCIETY OF ECONOMIC GEOLOGISTS

THE INSTITUTE OF PETROLEUM

EDITOR: ALAN MARA BATEMAN
Yale University, New Haven, Connecticut

BUSINESS EDITOR: MORRIS M. LEIGHTON
Illinois Geological Survey, Urbana, Illinois

ASSISTANT EDITORS

H. E. MCKINSTRY, *Harvard University*
JOE W. PEOPLES, *Wesleyan University*
F. M. CHACE, *M. A. Hanna Company*
J. D. BATEMAN, *Toronto, Ont.*
R. H. JAHNS, *California Institute of Technology, Pasadena*

ASSOCIATE EDITORS

CHARLES KENNETH LEITH
University of Wisconsin, Madison, Wis.

D. F. HEWETT
U. S. Geological Survey, Washington, D. C.

A. I. LEVORSEN
Tulsa, Okla.

B. S. BUTLER
Univ. of Arizona, Tucson, Ariz.

W. E. WRATHER
U. S. Geological Survey, Washington, D. C.

A. N. SAYRE
U. S. Geological Survey, Washington, D. C.

L. C. GRATON
Harvard University, Cambridge, Mass.

E. S. MOORE
Univ. of Toronto, Toronto, Can.

PER GEIJER
Geological Survey of Sweden, Stockholm, Sweden

P. F. FOURMARIER
Liège University, Liège, Belgium

M. S. KRISHNAN
Geological Survey, Calcutta, India

DJALMA GUIMARÃES
Instituto de Tecnologia Industrial Belo Horizonte, Minas Gerais, Brazil

T. W. GEVERS
University of the Witwatersrand, Johannesburg, S. Africa

VOLUME 47

NEW HAVEN, CONNECTICUT
THE ECONOMIC GEOLOGY PUBLISHING COMPANY
1952

Ser
QE
1
E15
V47
1952

SOCIETY OF ECONOMIC GEOLOGISTS

THE PUBLICATIONS OF WHICH CONSTITUTE
A PART OF THIS JOURNAL

OFFICERS FOR 1952

H. G. FERGUSON.....*President*
DONALD M. DAVIDSON.*Vice President*
OLAF N. ROVE.....*Secretary*
U. S. Geological Survey, Washington 25, D. C.
JOSEPH T. SINGEWALD, JR...*Treasurer*
Johns Hopkins Univ., Baltimore, Md.

Councilors

1952	*1953*	*1954*
H. M. BANNERMAN	HARRISON A. SCHMITT	CLAYTON G. BALL
JOHN S. BROWN	LLOYD M. SCOFIELD	MURL M. GIDEL
CHARLES F. PARK, JR.	C. O. SWANSON	ROGER H. MCCONNEL

Regional Vice-Presidents

JENARO R. GONZALES, North America..GUILLERMO ZULOAGA, South America
F. A. J. BLONDEL, Europe.....JOHN L. FARRINGTON, Africa
M. B. RAMACHANDRA RAO, Asia.....N. H. FISHER, Australia

Executive Committee

H. G. FERGUSON, *Chairman* DONALD M. DAVIDSON JOSEPH T. SINGEWALD, JR.
IRA B. JORALEMON OLAF N. ROVE

Finance Committee

DONALD M. DAVIDSON, *Chairman* IRA B. JORALEMON OLAF N. ROVE
JOSEPH T. SINGEWALD, JR.

Program Committee

R. H. JAHNS, *Chairman* O. P. JENKINS OLAF N. ROVE
JOE WEBB PEOPLES E. H. WISSER ELDRED WILSON

Committee on Publications

EUGENE N. CAMERON, *Chairman* EDWARD L. CLARK H. E. MCKINSTRY

Nominating Committee

IRA B. JORALEMON, *Chairman* THOMAS M. BRODERICK M. M. LEIGHTON

Admissions Committee

HAROLD M. BANNERMAN, *Chairman* JOHN H. WIESE CHARLES F. PARK, JR.
JAMES E. GILL ROGER H. MCCONNEL

Auditing Committee

FRANCIS G. WELLS, *Chairman* A. NELSON SAYRE

Coal Research Committee

Executive Members: Walter V. Searight, *Chairman*, Paul Averitt,
Clayton G. Ball, G. H. Cady

CONTENTS OF VOLUME 47.

Number 1.

The Geology of the Holden Mine.....*Elton A. Youngberg and Thomas L. Wilson* 1
Stress-Environment in the Genesis of Chrysotile, With Special Reference to the Occurrence at Woodsreef, Near Barraba, New South Wales
John S. Proud and George D. Osborne 13
Geology of the Iron King Mine, Yavapai County, Arizona.....*S. C. Creasey* 24
Geophysical Exploration in Michigan.....*Richard H. Wesley* 57
Origin and Pyrometasomatic Zoning of the Capitan Iron Deposits, Lincoln County, New Mexico.....*Vincent C. Kelley* 64
Development of Water Resources in Algeria, With Particular Reference to the Chott Chergui Project.....*H. W. Underhill* 84
With a Foreword by.....*Frank Debenham* 84

Scientific Communications:

A New Diagrammatic Scheme for Paragenetic Relations of the Ore Minerals
Forbes Robertson and Paul L. Vandeveer 101
National Science Foundation Appropriation Permits Science Research Support and Training Programs to Begin..... 105

Reviews:

Phase Transformations in Solids (Smoluchowski, Editor)..*Mead LeRoy Jensen* 107
Tables for Microscopic Identification of Ore Minerals (Uytenbogaardt)
Charles Milton 108
Atlas für Angewandte Steinkohlenpetrographie (Deutschen Kohlenbergbau-Leitung).....*Gilbert H. Cady* 109
The Formation of Mineral Deposits (Alan Bateman).....*D. M. Davidson* 111
The Woodbine and Adjacent Strata of the Waco Area of Central Texas—A Symposium (Lozo & Perkins, Editors)..... 113
The Sea Around Us (Carson)..... 113
The Tectonics of Middle North America—Middle North America East of the Cordilleran System (King)..... 114
Physical Geography (Strahler)..... 114
Books Received.....*Charles H. Smith* 115

Society of Economic Geologists:

Abstracts of papers to be presented at the New York Meeting, February 18-20, 1952..... 119

Scientific Notes and News..... 129

Number 2.

Preliminary Studies on the Biogeochemistry of Iron and Manganese
Harry V. Warren, Robert E. Delavault, and Ruth I. Irish 131
Mineralization Related to Granitization.....*G. E. Goodspeed* 146

386112

Minor Elements in Arkansas Bauxite.....*Mackenzie Gordon, Jr. and K. J. Murata* 169
The Geochemistry of the Ores of Franklin, New Jersey.....*John Drew Ridge* 180
Geological Activities in Asia.....*Chingyuan Y. Li* 193
A Study of the Seyler Theory of Coal Reflectance.....*J. T. McCartney* 202

Discussions:

A Study of Seyler's Theory of Coal Reflectance.....*Clarence A. Seyler* 211
A Reply.....*J. T. McCartney* 214
The Origin of Michigan Copper Deposits.....*Thomas M. Broderick* 215
How to Write Geologese.....*Nicholas Vanserg* 220

Reviews:

Stratigraphy and Sedimentation (Krumbein and Sloss)....*Charles W. Merriam* 224
Principes de Géologie, 3rd Edit. (Fourmarier).....*Walter H. Wheeler* 226
Mechanical Basis for Certain Geologic Structures (Hubbert)..*H. E. McKinstry* 226
Stress Distribution and Faulting (Hafner).....*H. E. McKinstry* 226
Michigan Copper and Boston Dollars (Gates, Jr.).....*Thomas M. Broderick* 227
Proceedings of the Fourth Empire Mining and Metallurgical Congress, Great Britain, July 9th–23rd, 1949. 2 Volumes (Higham)..... 229
Principles of Human Geography, 6th Edit. (Shaw and MacFarland)..... 230
South African Scenery—A Textbook of Geomorphology, 2nd Edit. (King)..... 230
Books Received.....*Charles H. Smith* 231

Scientific Notes and News..... 240

Number 3.

Age Cannot Wither or Varieties of Geologic Experience.....*Ira B. Joralemon* 243
Spectrographic Studies of Pyrite in Some Eastern Canadian Gold Mines *J. E. Hawley* 260
The Age of the "Lower Cretaceous" from Bisbee, Arizona Uraninite *George W. Bain* 305
Geologic and Economic Significance of the Hutson Zinc Mine, Salem, Kentucky—Its Relation to the Illinois-Kentucky Fluorospar District.....*W. A. Oesterling* 316
Karst Ore in Yunnan.....*Fred Searls, Jr.* 339

Discussions:

Alpine Lead-Zinc Ores of Europe.....*F. Gordon Smith* 347
Late Magnatic Ores and the Palisade Diabase Sheet.....*Frederick Walker* 349

Reviews:

Applied Geology, A Symposium (Tuyl and Kuhn).....*James A. Noble* 352
Giants of Geology (C. L. Fenton and M. A. Fenton).....*Gerald M. Friedman* 353
Geology and Ore Deposits of the Front Range, Colorado (Lovering and Goddard).....*John R. Coash* 354
Golden Years, 1851–1951 (Doyle).....*H. E. McKinstry* 356
Internal Constitution of the Earth, 2nd revised edition of Vol. VII of the Physics of the Earth (Gutenberg)..... 356
Die Lagerstatten nutzbarer Mineralien (Granigg; Horvath and Gerzabek)..... 357
Dana's System of Mineralogy, 7th Edition, Volume 2 (Palache, Berman, and Frondel)..... 357
Energy Sources—The Wealth of the World (Ayres and Scarlott)..... 358
Books Received.....*Charles H. Smith* 358

Scientific Notes and News..... 364

Number 4.

The Structure and Origin of the Banded Hematite Jaspers of Singhbhum, India
E. Spencer and F. G. Percival 365
Differential Thermal Curves of Selected Lignites..*W. J. Smothers and Yao Chiang* 384
Antimony Deposits of Tuscany.....*G. Dessau* 397
Indicator Minerals, Coeur D'Alene Silver Belt.....*Thomas W. Mitcham* 414
The Relationship Between Polarization Colors and Rotation Properties of Anisotropic Minerals.....*L. H. Green* 451

Scientific Communications:
Research, Followship Grants Renewed by Shell Oil Company for 1952–53..... 459

Discussions:
"How to Write Geologese".....*Frank C. Calkins* 460

Reviews:
A Land (Hawkes).....*Gerald M. Friedman* 462
The Barker Index of Crystals (Porter and Spiller).....*Horace Winchell* 463
Theoretical Petrology (Barth)..... 464
The Dynamics of Faulting, and Dyke Formation with Applications to Britain, 2nd Edit. (Anderson)..... 465
Handbook of Gem Identification, 3rd Edit. (Liddicoat, Jr.)..... 465
Magic Oil, Servant of the World (Leeston)..... 465
Introduction to Geophysical Prospecting (Dobrin)..... 465
Water (Fox)..... 466
Dana's Manual of Mineralogy, 16th Edit. (Hurlbut, Jr.)..... 466
Les Pegmatites—Les Pegmatites Granitiques (Fersman)..... 467
Féstschrift Zum Siebzigsten Geburtstag Von Rudolf Richter (Schmidt and Solle) 468
Books Received.....*Frank G. Lesure* 468

Scientific Notes and News..... 477

Number 5.

The Lead and Zinc Deposits of the Bou-Beker-Touissit Area, Eastern French Morocco.....*Jacques Cloveau, Jean Paulhac, and Jean Pellerin* 481
Opaque Matter in Coal.....*P. A. Hacquebard* 494
Abnormal Copper, Lead, and Zinc Content of Soil Near Metalliferous Veins
Lyman C. Huff 517
Radioactivity of Waters Issuing from Sedimentary Rocks.....*Stanko Miholić* 543
Landslides and Rapid-Flowage Phenomena near Pierre, South Dakota
Dwight R. Crandell 548

Discussions:
Metamorphism of Coal.....*G. H. Cady* 569

Reviews:
Principles of Geochemistry (Mason).....*M. M. Leighton* 572
Monographien der Deutschen Blei-Zink-Erzlagerstaetten, Monographie 1, Die Blei-Zink-Erzvorkommen des Ruhrgebietes und seiner Umrandung (Hesemann and Pilger).....*Gerald M. Friedman* 572
The Geology and Mineral Resources of the Neighbourhood of Kuantan, Pahang (Fitch)..... 573
The Future of Our Natural Resources (Raushenbush, Editor)..... 573

Gesteine und Minerallagerstätten, Band II, Exogene Gesteine und Mineral-lagerstätten (Niggli) 574
Books Received ..... *H. R. Tremaine* 574

Scientific Notes and News 578

Number 6.

A Preliminary Description of the Nigerian Lead-Zinc Field ..... *J. L. Farrington* 583
X-ray Study of Coal from Logan County, West Virginia, and a Discussion of the Structure of Coal ..... *Robert S. Young and David S. Robertson* 609
Allard Lake Ilmenite Deposits ..... *Paul Hammond* 634
Structural Environments of the Lead Deposits in the Southeastern Missouri Mining District ..... *Jack A. James* 650
Fields of Formation of Some Common Hydrothermal-Alteration Minerals *Bronson Stringham* 661
Chlorite-Calcite Pseudomorphs after Orthoclase Phenocrysts, Ray, Arizona *George M. Schwartz* 665

Discussions:
Alpine Lead-Zinc Ores of Europe ..... *Henry L. Jicha, Jr.* 673

Reviews:
Principles of Petroleum Geology (Tiratsoo) 675
Imperfections in Nearly Perfect Crystals (edited by Shockley) 675
Panorama of Science, 1952, Annual Supplement to the Smithsonian Series for 1952 (Compiled and edited by True) 676
Geology (von Engeln and Caster) 676
Journal of Research into the Geology and Natural History of the Various Countries Visited by H. M. S. Beagle (Darwin) 677
Books Received ..... *H. R. Tremaine* 677

Society of Economic Geologists:
Preliminary Announcement 682

Scientific Notes and News 683

Number 7.

Supergene and Hydrothermal Dispersion of Heavy Metals in Wall Rocks Near Ore Bodies, Tintic District, Utah ..... *H. T. Morris and T. S. Lovering* 685
Some Simple Aids in the Hydrothermal Investigation of Mineral Systems *Rustum Roy and E. F. Osborn* 717
Radioactivity as a Guide to Ore ..... *W. H. Gross* 722
Sources of Error in the Decrepitation Method of Study of Liquid Inclusions *Thomas Edwin Stephenson* 743
Uranium-Copper Deposits, Rum Jungle, Australia ..... *C. J. Sullivan and R. S. Matheson* 751

Discussion:
Chemically Pure Geologese ..... *Duncan McConnell* 759

Reviews:
The Mineral Resources of the World, Vol. II, Atlas of the World's Resources (Van Royen and Bowles; Pehrson) 761

Mines Register, Successor to the Mines Handbook (Zimmerman, Editor) 761
Practical and Experimental Geography (Balchin and Richards) 762
Europe, 2nd Edit. (Van Valkenburg and Held) 762
Tabellen zur Optischen Bestimmung der Gesteinsbildenden Minerale (Troger) .. 762
Geography of Living Things (Anderson) 762
Books Received ..... *Frank G. Lesure* 763

Society of Economic Geologists:
Abstracts of Papers to be Presented at the November Meeting in Boston, Massachusetts, November 13–15, 1952 767

Scientific Notes and News 782

Number 8.

Autoradiographic Study of Marine Shales ..... *Virginia F. Ross* 783
Structural Localization of Ground Water in Limestone—"Big Bend District," Texas-Mexico ..... *George A. Kiersch and Paul W. Hughes* 794
The Application of Polarization Figures and Rotation Properties of the Identification of Certain Telluride Minerals ..... *Donald H. Hase* 807
Mineralization of the Volcano District, Elmore County, Idaho ... *Rhesa M. Allen, Jr.* 815

Discussions:
Some Pipe Deposits of Eastern Australia ..... *Roland Blanchard* 822
The Deformation of Banded Ironstones in Southern Rhodesia .... *Geoffrey Bond* 823

Reviews:
Third International Congress on Carboniferous Stratigraphy .... *Gilbert H. Cady* 825
Stepping Stones to the South Pole (Nichol) 828
Contemporary Ethiopia (Talbot) ..... *B. A. Brombert* 828
Ertzmikroskopisches Praktikum (Schneiderhöhn) 829
Books Received ..... *Frank G. Lesure* 830

Scientific Notes and News 835
Index, Volume 47 837
Contents, Volume 47 iii